

## 3.3 Slopes of Lines

$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope.

1. A(1, 3) B(-2, -3)

2. C(8, -2) D(5, 3)

$$m = \frac{3 - (-3)}{1 - (-2)} = \frac{6}{3}$$

$$m = 2$$

$$m = \frac{3 - (-2)}{5 - 8} = \frac{5}{-3}$$

$$m = -\frac{5}{3}$$

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eqn.  $y = 1$   
3. E(8, 1) F(4, 1)

$$m = \frac{1-1}{8-4} = \frac{0}{4}$$

$$m = 0$$

horizontal



eqn.  $x = -2$   
4. G(-2, 1) H(-2, -5)

$$m = \frac{-5-1}{-2-(-2)} = \frac{-6}{0}$$

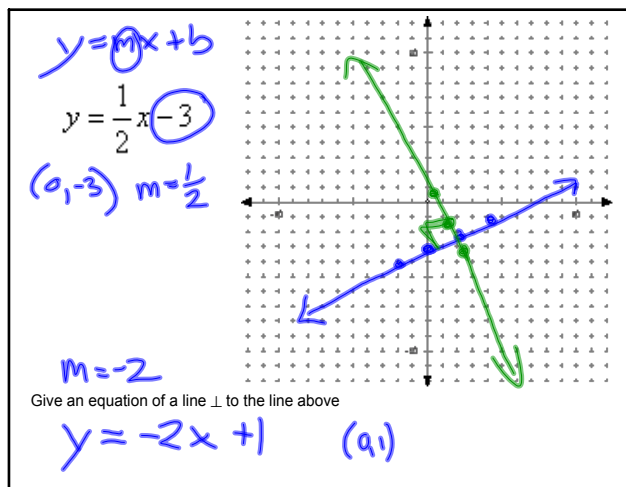
undefined  
no slope

Parallel lines have same slope.

Perpendicular lines have opposite reciprocal  
 $m = \frac{2}{3}$        $m = -\frac{3}{2}$

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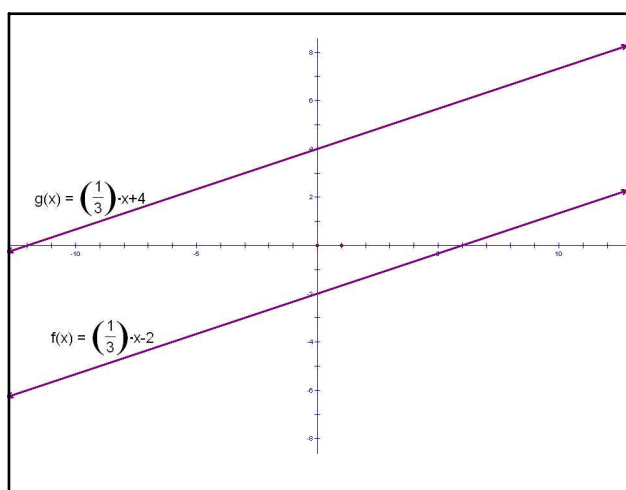
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Graph the two equations listed.

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3-4 Equations of lines  
 Slope-intercept form  $y = mx + b$   
 Point-slope form  $y - y_1 = m(x - x_1)$   
 Standard form  $Ax + By = C$

$\swarrow$  slope  
 $\nwarrow$  y-int.  
 $\swarrow$  no fract. no decim.

$2x + 4y = 8$   
 $x + 2y = 4$

A, B, & C are integers, A is positive,  
 A, B, & C have a GCF of 1

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Write the equation of the line given the following information.

1.  $(0, 8)$   $m = 3$

$$y = mx + b$$

$$y = 3x + b$$

$$y = 3x + 8$$

2.  $(-3, -6)$   $m = 2$

$$y = mx + b$$

$$y = 2x + b$$

$$-6 = 2(-3) + b$$

$$-6 = -6 + b$$

$$0 = b$$

$$y = 2x$$

$$0 = 2x - y \quad \text{Std Form}$$

$$2x - y = 0$$

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3.  $(6, -3)$   $(8, -9)$

$$m = \frac{-9 - (-3)}{8 - 6} = \frac{-6}{2} = -3$$

$$m = -3$$

Point Slope  $y - y_1 = m(x - x_1)$

$$y + 3 = -3(x - 6)$$

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4. Write the equation of the line  $\perp$  to  $2x + y = 5$  and passes through  $(1, -7)$ .

$$y = -2x + 5$$

$$m = -2$$

$$m = \frac{1}{2} \quad (1, -7)$$

$$y = \frac{1}{2}x - 7\frac{1}{2}$$

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5. Write the equation of the line  $\parallel$  to  $3y - x = 4$  and passes through  $(3, 10)$ .

$$y = \frac{1}{3}x + 9$$

$$3y = x + 4$$

$$y = \frac{1}{3}x + \frac{4}{3}$$

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6. Write the equation of the line  $\perp$  to the line containing (4, 3) (4, 8) and passing through (2, -9).

$$m = \frac{8-3}{4-4}$$

undefined  
 $x=4$

horizontal (2, -9)  
 $y = -9$

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HW p142-143 #s ~~15~~ 23 odd, 28, 31, 33, ~~36~~  
P148-149 #s 19, 22, 39, 41, 43, ~~44~~

Change

HW p142-143 #s 19-23 odd, 28, 31, 33  
P148-149 #s 19, 22, 39, 41, 43

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